

FIG. 1A

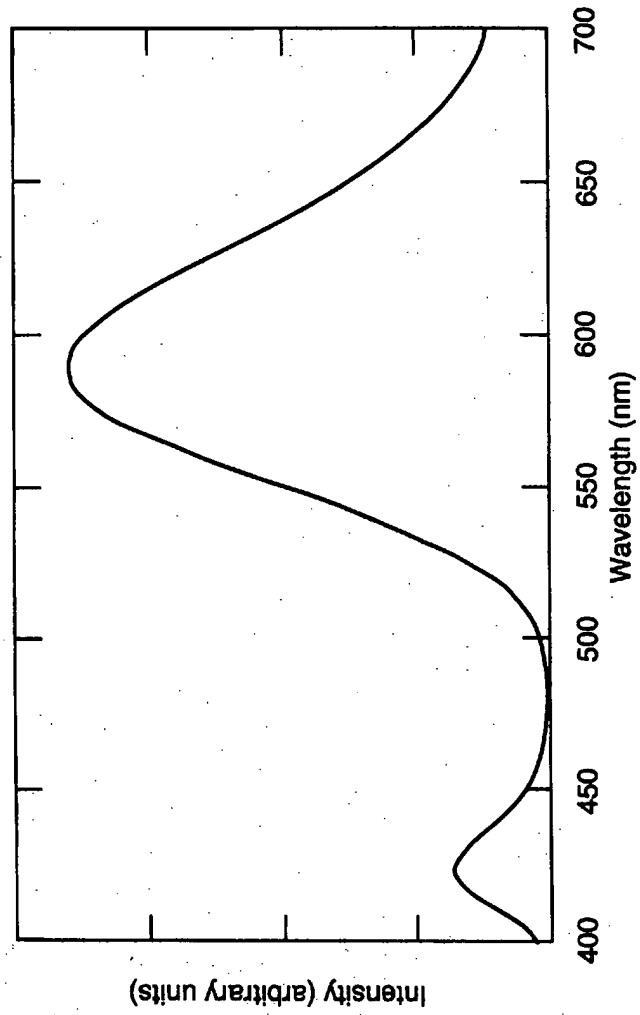


FIG. 1B

Fig. 2A. Fluorescence spectra of $\text{Ca}_5(\text{PO}_4)_3\text{F}$ and $\text{Ca}_5(\text{PO}_4)_3\text{Cl}$.

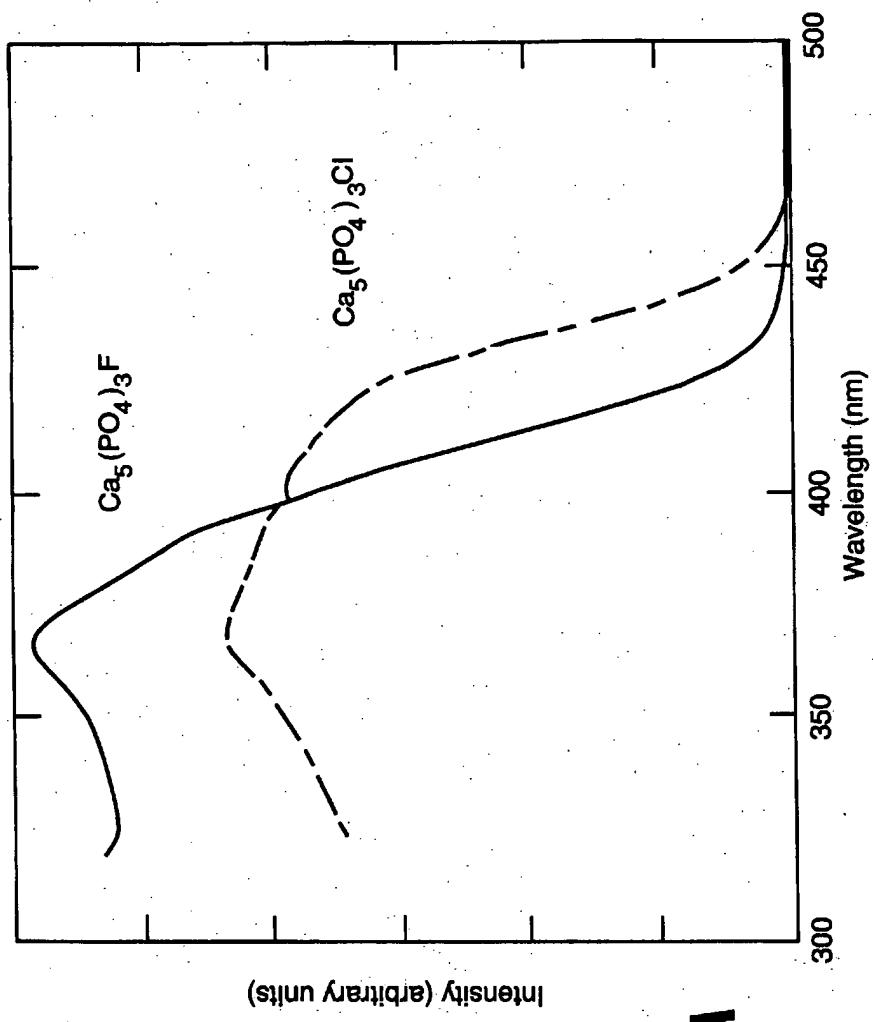


FIG. 2A

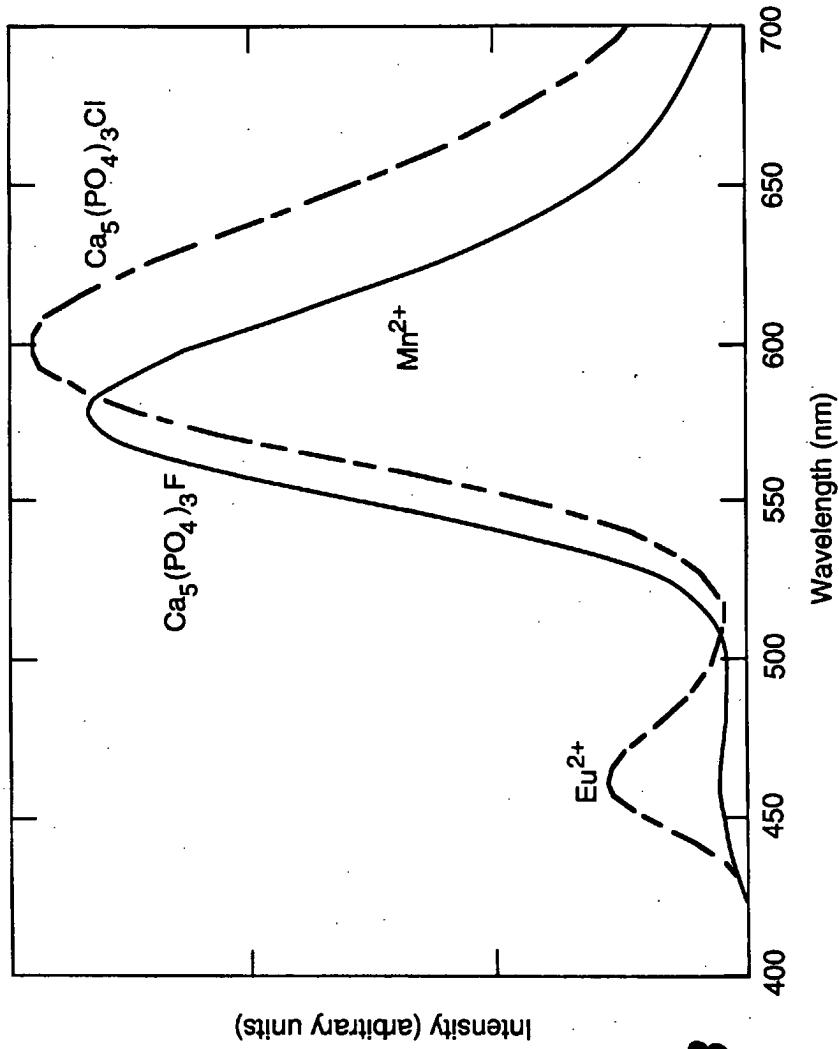


FIG. 2B

5/11

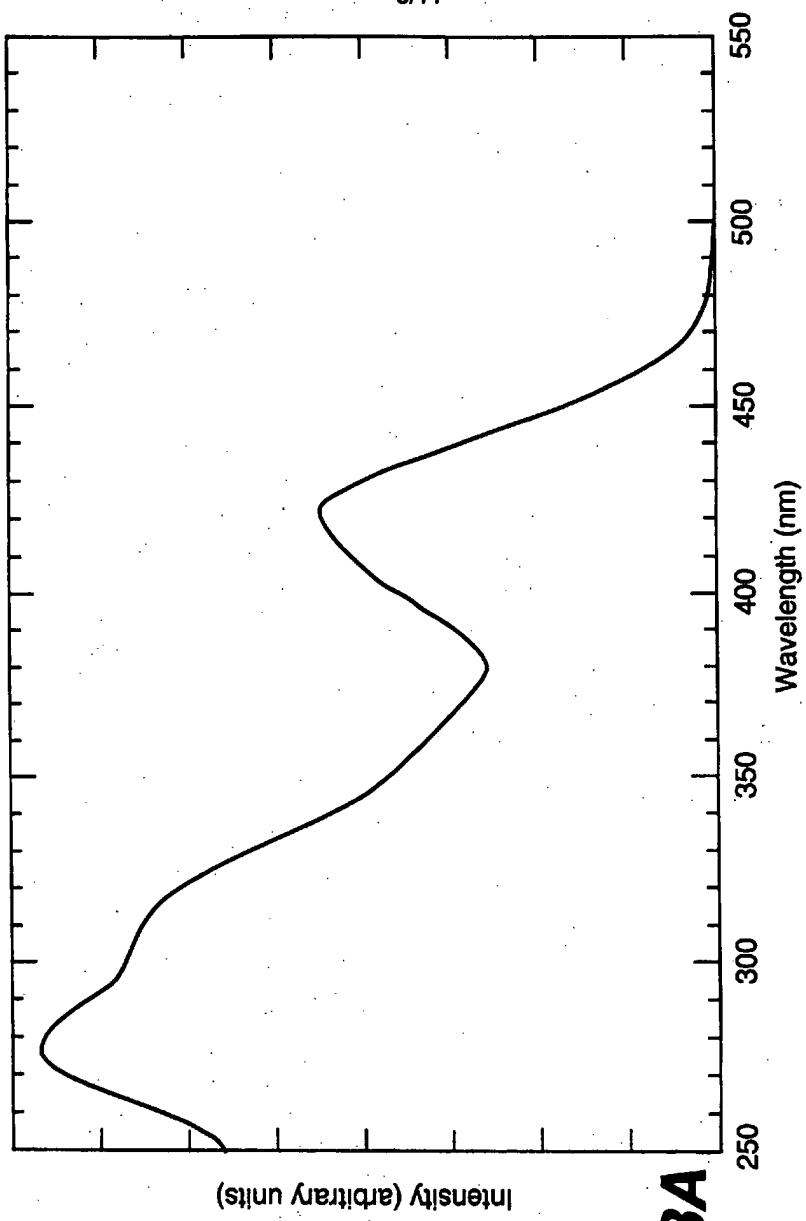


FIG. 3A

6/11

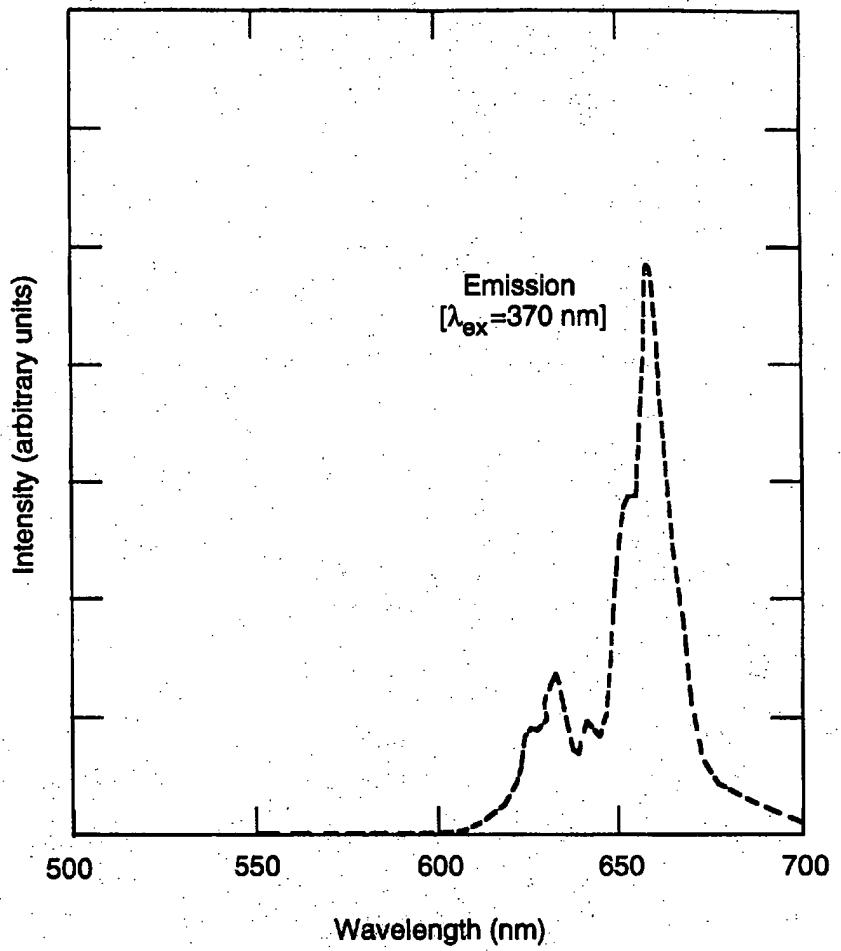


FIG. 3B

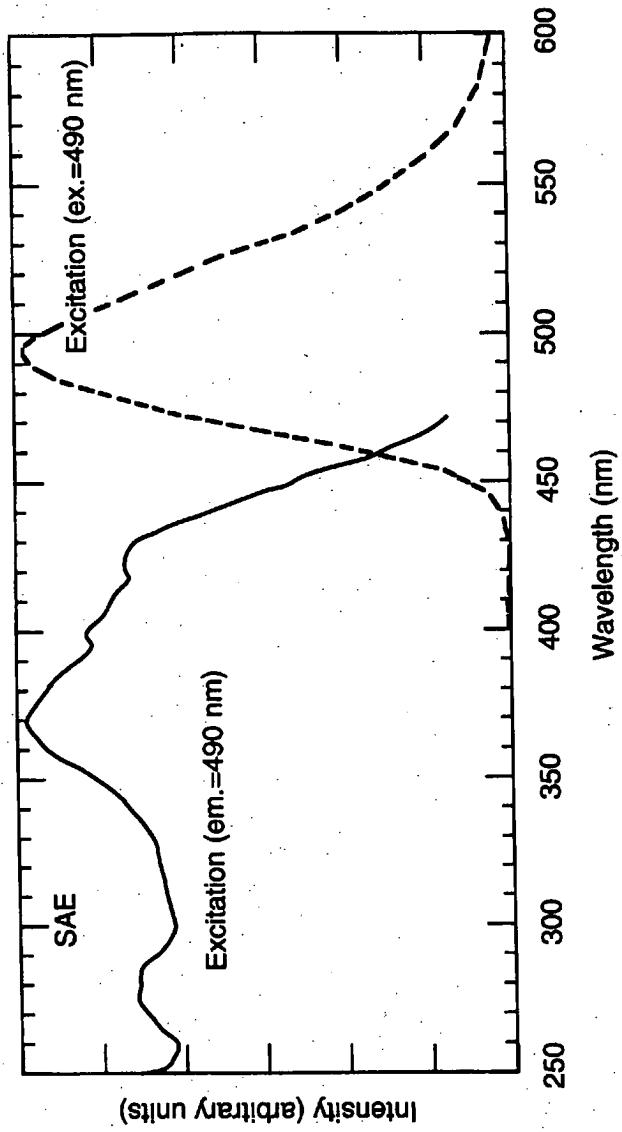


FIG. 4

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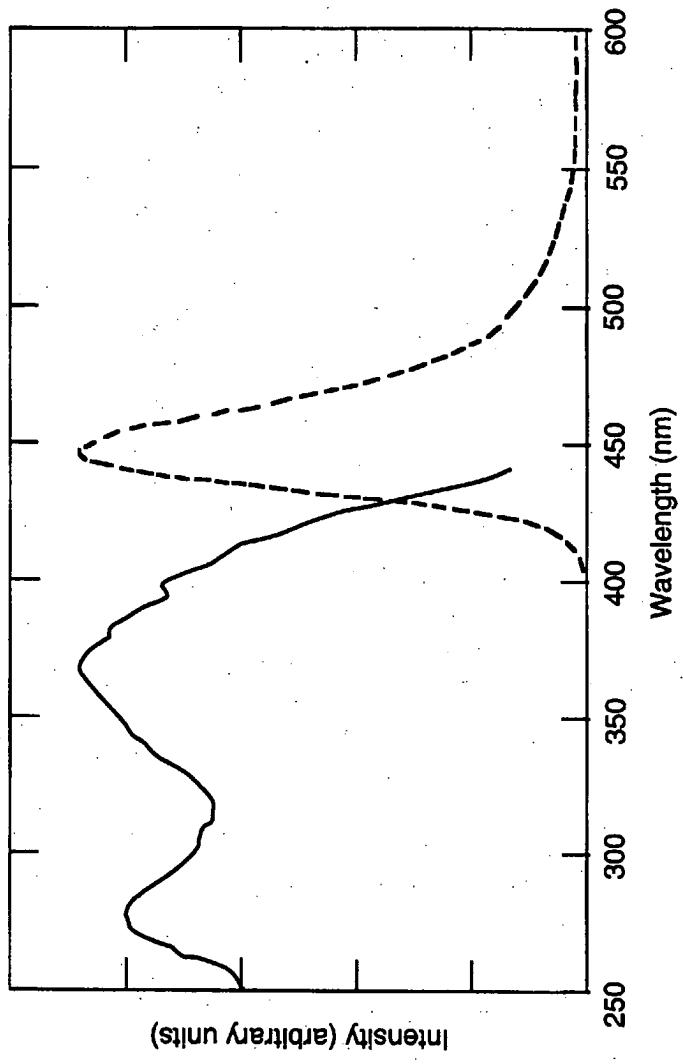


FIG. 5

Wavelength (nm)

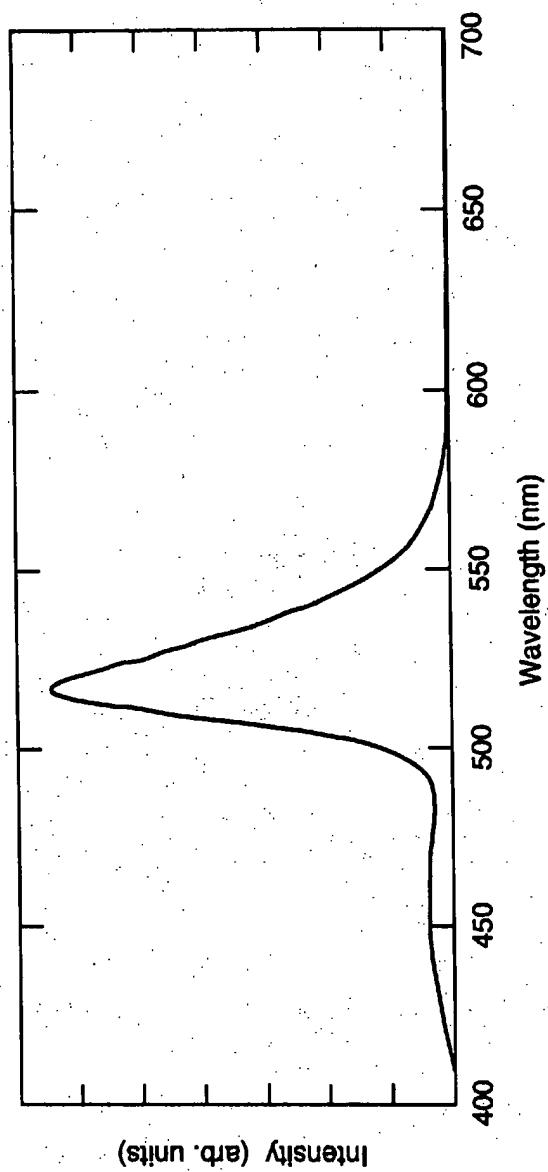


FIG. 6

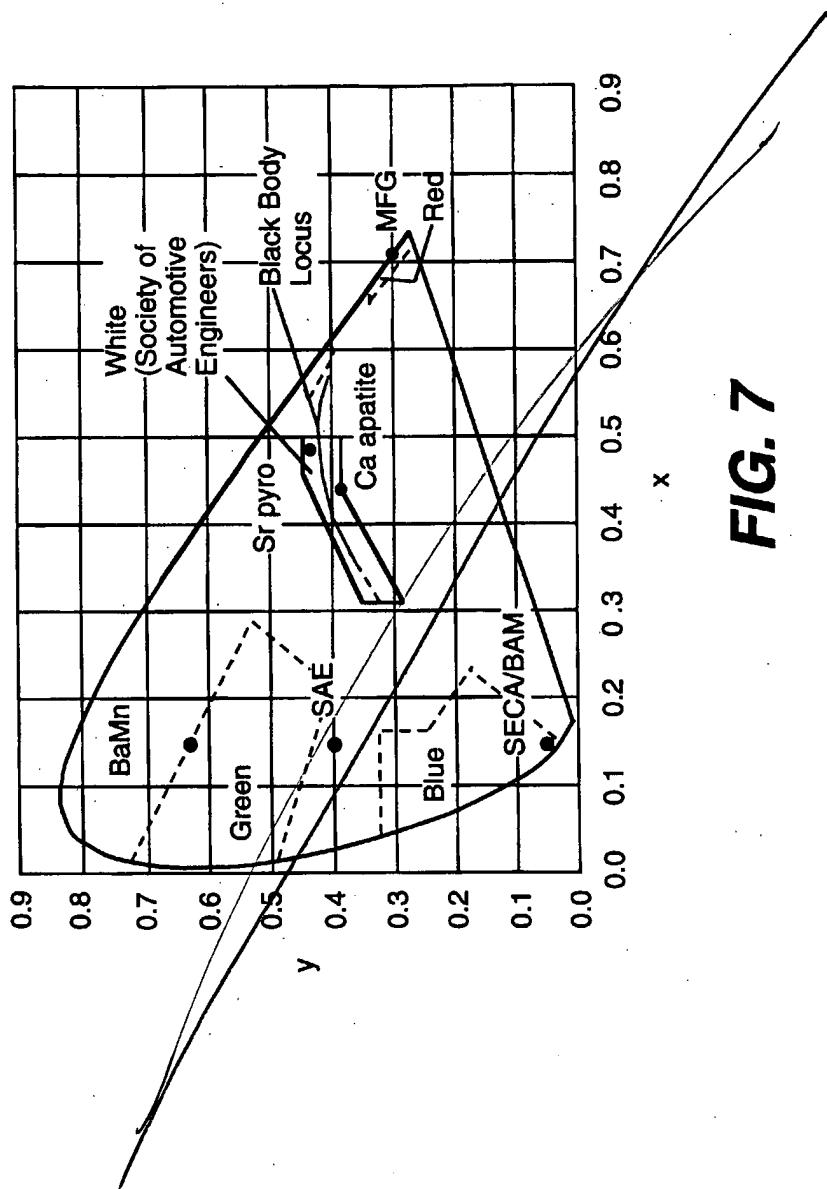


FIG. 7

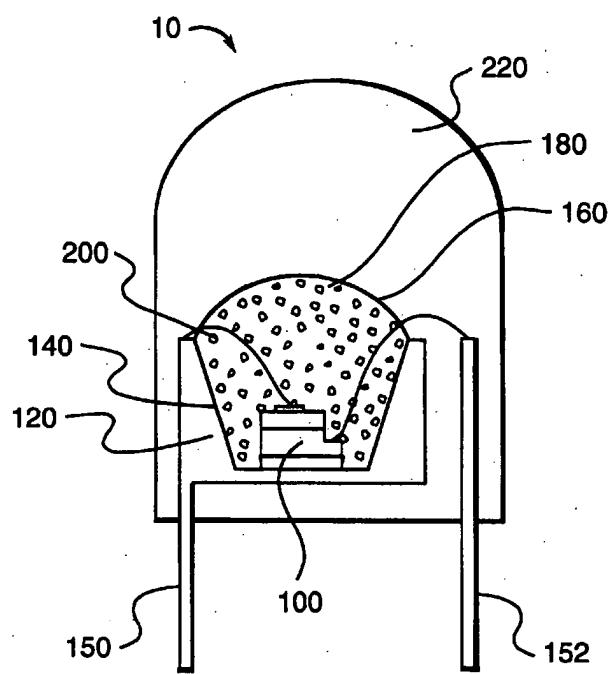


FIG. 8

FIGURE 9

Table I

| Example | Sr Pyrophosphate | $\text{Ca}(\text{PO}_4)_2\text{Cl}$: $\text{Eu}^{3+}, \text{Mn}^{2+}$ | SAE | MFG | $\text{BaMgAl}_{16}\text{O}_{37}\text{Cl}: \text{Eu}^{2+}, \text{Mn}^{2+}$ | $\text{Sr}_5(\text{PO}_4)_3\text{Cl}: \text{Eu}^{2+}$ or $\text{Ba}_2\text{MgAl}_{16}\text{O}_{37}\text{Cl}: \text{Eu}^{2+}$ | CT (K) | CRI | Luminosity (L/W _{rad}) | Distance from black body locus |
|---------|------------------|--|-------|-------|--|--|--------|-----|----------------------------------|--------------------------------|
| 1 | 0.724 | 0 | 0 | 0 | 0.185 | 0.091 | 4100 | 73 | 355.13 | 0.03 |
| 2 | 0.798 | 0 | 0.045 | 0.014 | 0.113 | 0.030 | 3500 | 70 | 360.83 | 0.03 |
| 3 | 0.778 | 0 | 0 | 0.023 | 0.106 | 0.093 | 3500 | 70 | 343.06 | 0.003 |
| 4 | 0.678 | 0 | 0.065 | 0.099 | 0.086 | 0.072 | 3500 | 80 | 321.28 | 0.003 |
| 5 | 0.658 | 0 | 0.056 | 0.047 | 0.123 | 0.116 | 4100 | 80 | 322.84 | 0.003 |
| 6 | 0 | 0.706 | 0 | 0.044 | 0.180 | 0.071 | 4100 | 80 | 343.37 | 0.003 |
| 7 | 0 | 0.759 | 0 | 0 | 0.070 | 0.171 | 4100 | 75 | 354.83 | 0.003 |
| 8 | 0 | 0.763 | 0 | 0.001 | 0.220 | 0.016 | 4100 | 75 | 373.80 | 0.03 |
| 9 | 0 | 0.787 | 0 | 0.056 | 0.156 | 0 | 3500 | 75 | 359.21 | 0.01 |
| 10 | 0 | 0.732 | 0 | 0.100 | 0.168 | 0 | 3500 | 80 | 348.26 | 0.011 |
| 11 | 0.632 | 0 | 0.095 | 0.133 | 0.075 | 0.0645 | 3500 | 85 | 310.79 | 0.002 |
| 12 | 0 | 0.676 | 0 | 0.140 | 0.162 | 0.022 | 3500 | 85 | 330.80 | 0.002 |
| 13 | 0.613 | 0 | 0.089 | 0.083 | 0.102 | 0.113 | 4100 | 85 | 312.04 | 0.002 |
| 14 | 0 | 0.634 | 0 | 0.086 | 0.186 | 0.074 | 4100 | 85 | 331.51 | 0.002 |
| 15 | 0.590 | 0 | 0.125 | 0.164 | 0.650 | 0.055 | 3500 | 90 | 301.47 | 0.002 |
| 16 | 0 | 0.628 | 0 | 0.178 | 0.170 | 0.0242 | 3500 | 90 | 320.47 | 0.002 |
| 17 | 0.570 | 0 | 0.122 | 0.117 | 0.090 | 0.101 | 4100 | 90 | 302.45 | 0.002 |
| 18 | 0 | 0.606 | 0 | 0.127 | 0.193 | 0.075 | 4100 | 90 | 320.98 | 0.002 |
| 19 | 0.530 | 0 | 0.115 | 0.150 | 0.080 | 0.090 | 4100 | 95 | 293.39 | 0.002 |
| 20 | 0 | 0.560 | 0 | 0.166 | 0.200 | 0.075 | 4100 | 95 | 310.84 | 0.002 |